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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/675,400	09/30/2003	Min-ho Kim	5649-1124	6506

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EXAMINER	
AHN, SAM K	

ART UNIT	PAPER NUMBER
2611	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/675,400	KIM ET AL.	
	Examiner	Art Unit	
	Sam K. Ahn	2611	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *30 September 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-32* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,2,6-8,10-12,14-16,20-23,27-30 and 32* is/are rejected.

7)☒ Claim(s) *3-5,9,13,17-19,24-26 and 31* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *30 September 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *093003*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

1. Claims 10-12,14-16,20,29,30 and 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ninomiya et al. US 6,967,694 B1 (hereinafter, Ninomiya1).

 Regarding claim 10, Ninomiya1 teaches a carrier recovery apparatus (see Fig.1) comprising: an error compensating unit (element 12) that is configured to combine an input signal (input to element 12) with a frequency signal (output of element 18) to generate an output signal (output of element 12), wherein the output signal includes an error reference signal (see Fig.6 of the signal format); an error detecting unit (elements 116,105) that is configured to determine

location of the error reference signal in the output signal based on a real part of the output signal (element 101 within the element 116 detecting and determining the sync pattern, note c.4, l.52-59, based on a real part of the Data), and is configured to generate an error signal based on the location of the error reference signal in the output signal (Pherr); and an oscillator (element 18) that is configured to generate the frequency signal with a frequency that varies based on the error signal (element 18 is varied based on its input signal from Pherr). And although Ninomiya1 teaches the input and output signals are complex signals, such complex signals are well-known to one skilled in the art.
At the time of the invention, it would have been obvious to a person of ordinary skill in the art to implement as such. Applicant has not disclosed that the complex signal provides an advantage, is used for a particular purpose or solves a stated problem. One of ordinary skill in the art, furthermore, would have expected Applicant's invention to perform equally well with other signal formats such as in polar form because complex or polar form does not provide any different result, but merely differ in computation. Therefore, it would have been obvious to one of ordinary skill in this art to modify the teaching of Ninomiya1 and provide signals in complex format to obtain the invention as specified in the claim.

Regarding claim 11, Ninomiya1 further teaches wherein the error detecting unit (elements 116,105) comprises: a field synchronization detector (element 103) that is configured to determine location of a beginning and an end of the error

reference signal based on the real part of the complex output signal (note c.3, l.30-35); and a frequency error measuring unit that is configured to measure a variation in a phase angle of the complex output signal based on the location of the beginning and the end of the error reference signal that is determined by the field synchronization detector, and is configured to generate the error signal based on the variation in the phase angle of the complex output signal (element 105 determining the phase error from signal Segst 109).

Regarding claim 12, Ninomiya1 further teaches wherein the complex output signal is divided into frames (see Figs.5 and 6), and wherein the frequency error measuring unit is configured to generate the error signal for each of the frames of the complex output signal (element 105 continuously determining the phase error from signal Segst 109 when signals with frames are received).

Regarding claim 14, Ninomiya1 further teaches wherein the complex input signal is a VSB signal that is represented as a complex number, and wherein the error reference signal is a PN63 signal in a field synchronization signal of the complex input signal (see explanation in claim 10 for complex number and note c.1, l.10 for VSB signal, and further wherein PN63 signal is further shown in Fig.6).

Regarding claim 15, Ninomiya1 teaches wherein the error detecting unit (elements 116,105) comprises: a field synchronization detector (element 103)

that is configured to determine location of a beginning and an end of the error reference signal based on the real part of the output signal (note c.3, l.30-35); and a frequency error measuring unit that is configured to measure a variation in a phase angle of the output signal based on the location of the beginning and the end of the error reference signal that is determined by the field synchronization detector, and is configured to generate the error signal based on the variation in the phase angle of the output signal (element 105 determining the phase error from signal Segst 109).

And although Ninomiya1 teaches the input and output signals are complex signals, such complex signals are well-known to one skilled in the art.

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to implement as such. Applicant has not disclosed that the complex signal provides an advantage, is used for a particular purpose or solves a stated problem. One of ordinary skill in the art, furthermore, would have expected Applicant's invention to perform equally well with other signal formats such as in polar form because complex or polar form does not provide any different result, but merely differ in computation. Therefore, it would have been obvious to one of ordinary skill in this art to modify the teaching of Ninomiya1 and provide signals in complex format to obtain the invention as specified in the claim.

Regarding claim 16, Ninomiya1 further teaches wherein the complex output signal is divided into frames (see Figs.5 and 6), and wherein the frequency error

measuring unit is configured to generate the error signal for each of the frames of the complex output signal (element 105 continuously determining the phase error from signal Segst 109 when signals with frames are received).

Regarding claim 20, Ninomiya1 further teaches wherein the complex input signal is a VSB signal that is represented as a complex number, and wherein the error reference signal is a PN63 signal in a field synchronization signal of the complex input signal (see explanation in claim 10 for complex number and note c.1, l.10 for VSB signal, and further wherein PN63 signal is further shown in Fig.6).

Regarding claim 29, the claim is rejected as applied to claim 10 with similar scope. One skilled in the art would further recognize that the VSB signal of Ninomiya1 is a TV signal (note c.1, l16) with high definition (digital TV or DTV having a high resolution).

Regarding claim 30, the claim is rejected as applied to claim 11 with similar scope.

Regarding claim 32, the claim is rejected as applied to claim 14 with similar scope.

2. Claim 21 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ninomiya et al. US 2001/0033625 A1 (hereinafter, Ninomiya2).

Regarding claim 21, Ninomiya2 teaches a method of recovering a carrier in a complex high-definition TV signal, the method comprising: detecting the presence or absence of a pilot signal in the complex high-definition TV signal (see element 31 in Fig.4 and note paragraph 0080, wherein one skilled in the art would recognize that the digital TV system of Ninomiya2 has high definition); and selecting between performing a first function (element 13) on the high-definition TV signal and performing a second function (element 38) on the high-definition TV signal based on the detected presence or absence of the pilot signal in the complex high-definition TV signal (note paragraph 0080).

And although Ninomiya2 teaches that the signals are complex signals, such complex signals are well-known to one skilled in the art.

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to implement as such. Applicant has not disclosed that the complex signal provides an advantage, is used for a particular purpose or solves a stated problem. One of ordinary skill in the art, furthermore, would have expected Applicant's invention to perform equally well with other signal formats such as in polar form because complex or polar form does not provide any different result, but merely differ in computation. Therefore, it would have been obvious to one of ordinary skill in this art to modify the teaching of Ninomiya1 and provide signals in complex format to obtain the invention as specified in the claim.

Furthermore, Ninomiya2 teaches demodulation circuits (elements 13 and 38 in Fig.4) having its respective functions. And although Ninomiya2 does not explicitly

teach wherein said demodulation circuits comprises error detecting function, one skilled in the art would recognize any signal traveling to a channel medium experiences distortions that causes error to the signals transmitted. And it is well-known that demodulators, such as the demodulators of Ninomiya2 incorporates such function of detecting errors prior to demodulation output (also, see 201 in Fig.3 of Ninomiya1 for support) for the purpose of removing any errors in the signal received, thus increase the reliability from recovering the signals.

3. Claims 1,2,6-8,22,23,27 and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ninomiya et al. US 2001/0033625 A1 (hereinafter, Ninomiya2) in view of Ninomiya et al. US 6,967,694 B1 (hereinafter, Ninomiya1).

Regarding claim 22, Ninomiya2 teaches all subject matter claimed, as applied to claim 21. However, Ninomiya2 does not further teach the further step recited in claim 22.

Ninomiya1 teaches the steps of combining, determining and generating steps as explained in claim 10. Ninomiya1 further suggests that the steps recited are necessary in order to demodulate VSB modulated signals. Hence, both Ninomiya1 and Ninomiya2 suggest the necessity of having of VSB demodulator wherein Ninomiya1 further teaches the steps above and as explained in claim 22. Therefore, it would have been obvious to one skilled in the art at the time the invention was made to incorporate the VSB demodulating steps in the VSB

demodulator of Ninomiya2 (element 12) for the purpose of properly demodulating VSB signals (note c.1, l.7-12 of Ninomiya1).

Regarding claim 23, the claim is rejected as applied to claim 11 with similar scope.

Regarding claim 27, Ninomiya1 further teaches wherein the complex input signal is a VSB signal that is represented as a complex number, and wherein the error reference signal is a PN63 signal in a field synchronization signal of the complex input signal (see explanation in claim 10 for complex number and note c.1, l.10 for VSB signal, and further wherein PN63 signal is further shown in Fig.6).

Regarding claim 28, the claim is rejected as applied to claim 10 with similar scope. Ninomiya1 further teaches filtering the error signal (113 in Fig.1).

Regarding claim 1, the claim is rejected as applied to claim 22 with similar scope.

Regarding claim 2, the claim is rejected as applied to claim 23 with similar scope.

Regarding claim 6, the claim is rejected as applied to claim 26 with similar scope.

Regarding claim 7, the claim is rejected as applied to claim 27 with similar scope.

Regarding claim 8, the claim is rejected as applied to claim 21 with similar scope.

Allowable Subject Matter

4. Claims 3-5,9,13,17-19,24-26 and 31 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

5. The following is a statement of reasons for the indication of allowable subject matter: present application discloses a method and an apparatus of a system receiving a signal wherein the signal carries synchronization pattern and determining phase and frequency errors based on the synchronization pattern. Prior art teaches all the limitations claimed, however, prior art does not explicitly teach the equation to measure the frequency error as recited in claim 5, and does not explicitly teach the further limitation wherein initial signal of the complex signal is provided to the first detecting unit, and the second signal of the complex signal is provided to the second detecting unit.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sam Ahn whose telephone number is (571) 272-3044. The examiner can normally be reached on Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mohammad Ghayour can be reached on (571) 272-3021. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Sam K. Ahn
Patent Examiner
5/31/07